# Water Quality Update

## City Council Meeting

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*November 16, 2021*

CDM Smith

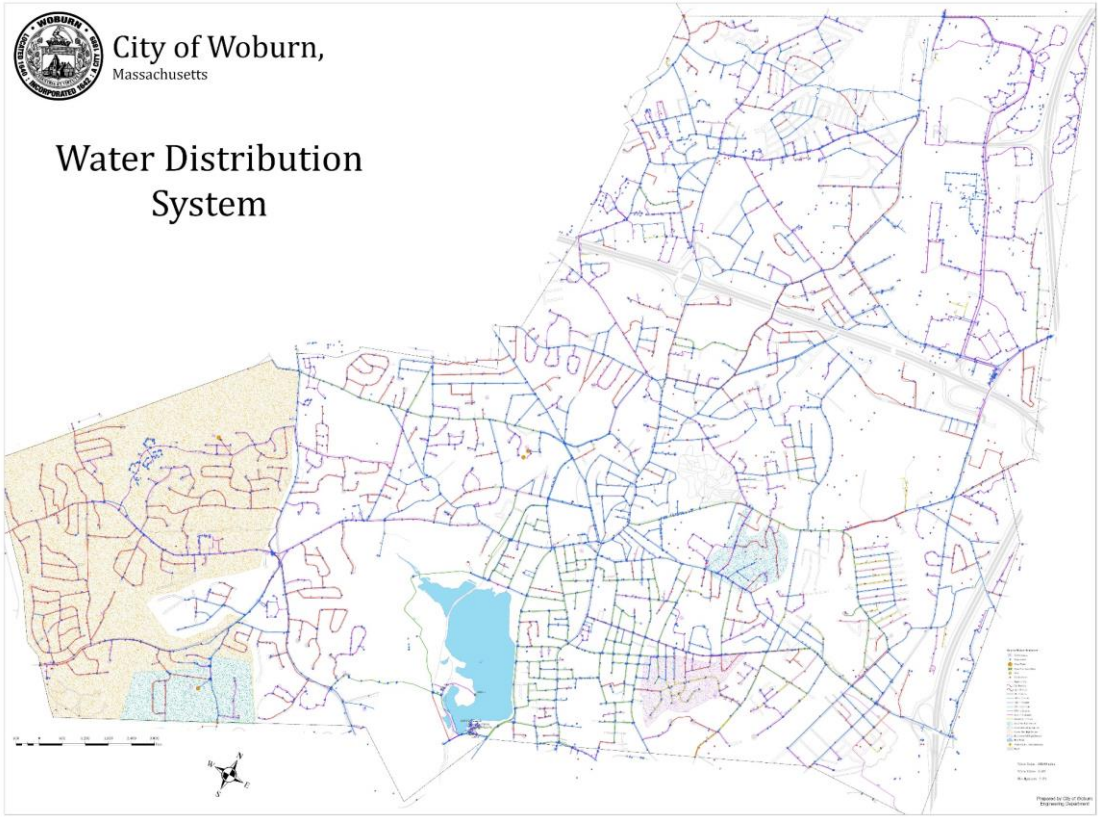
# Outline

1. Overview of City's Water System
2. PFAS Background
3. Horn Pond Results
4. PFAS Treatment for Drinking Water
5. Next Steps and Timeline
6. Questions/Discussion

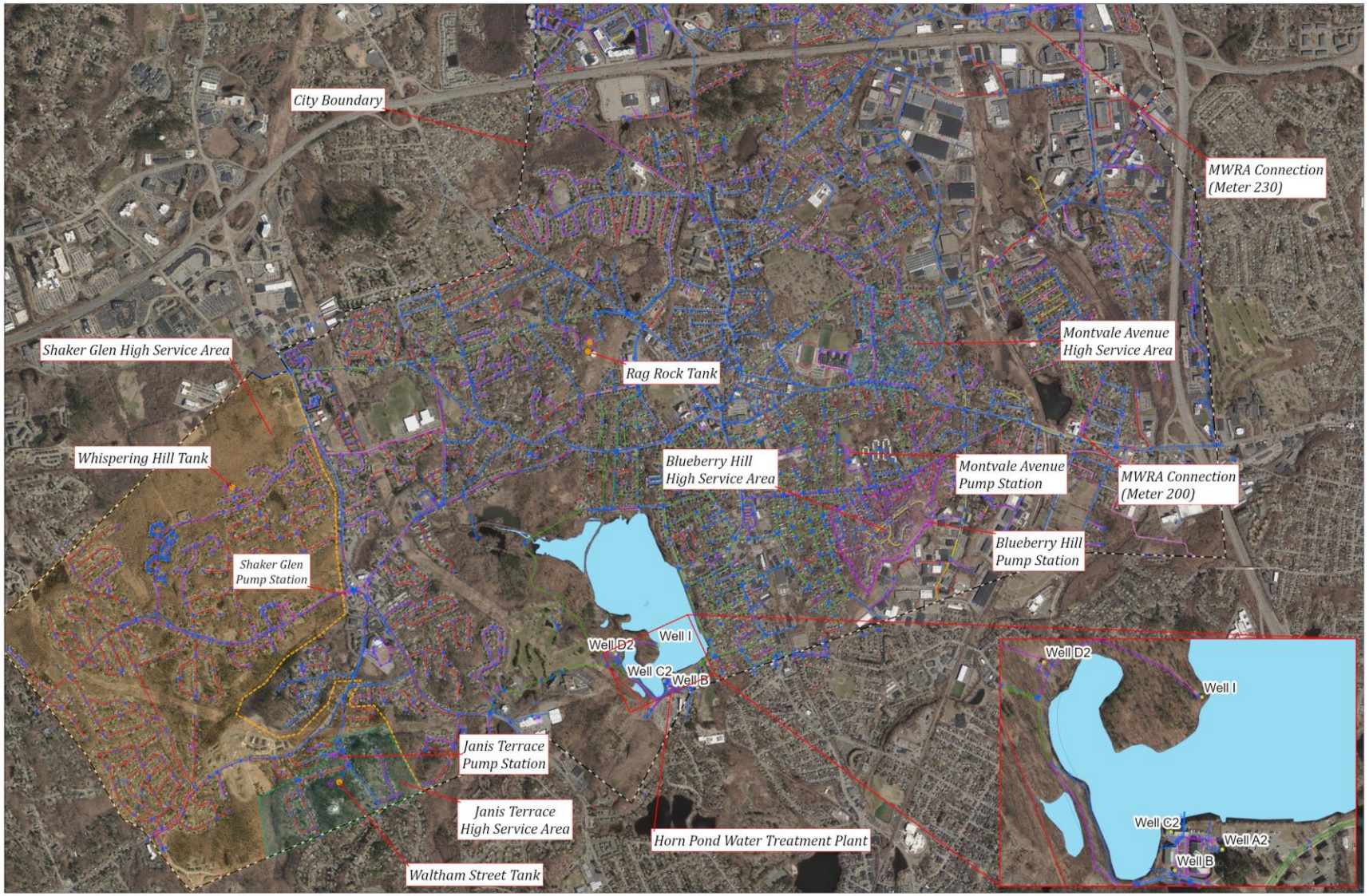
# 1. Overview of City's Water System

# Overview of the City's Water System

- Two sources
  - Main supply – 5 groundwater wells
  - Backup supply – 2 MWRA connections
- Horn Pond Water Treatment Plant
- Three storage tanks
- Four major booster pumping stations
- 165 miles of water mains



# Overview of the City's Water System




COST OF WATER
City Wells
MWRA
$4,750
$2,000
DOLLARS PER MILLION GALLONS

# 2. PFAS Background

# PFAS in Manufactured Products

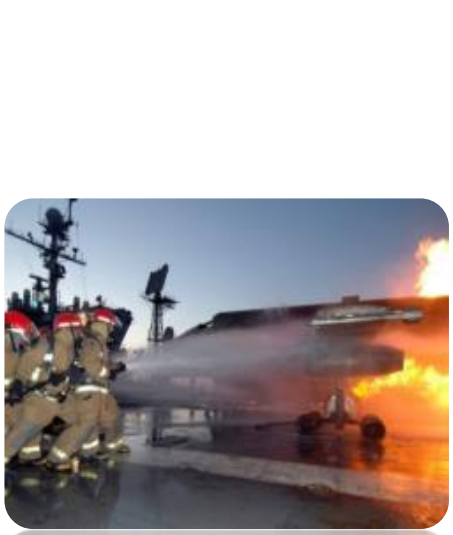
- Unique chemical & physical properties that make them extremely persistent and mobile in the environment
- Resistant to heat, water, grease and stains
- First produced by 3M in 1949
- Approved for food packaging in 1967



http://www.defence.gov.au/Environment/PFAS/pfas.asp

# Major Industrial PFAS Sources

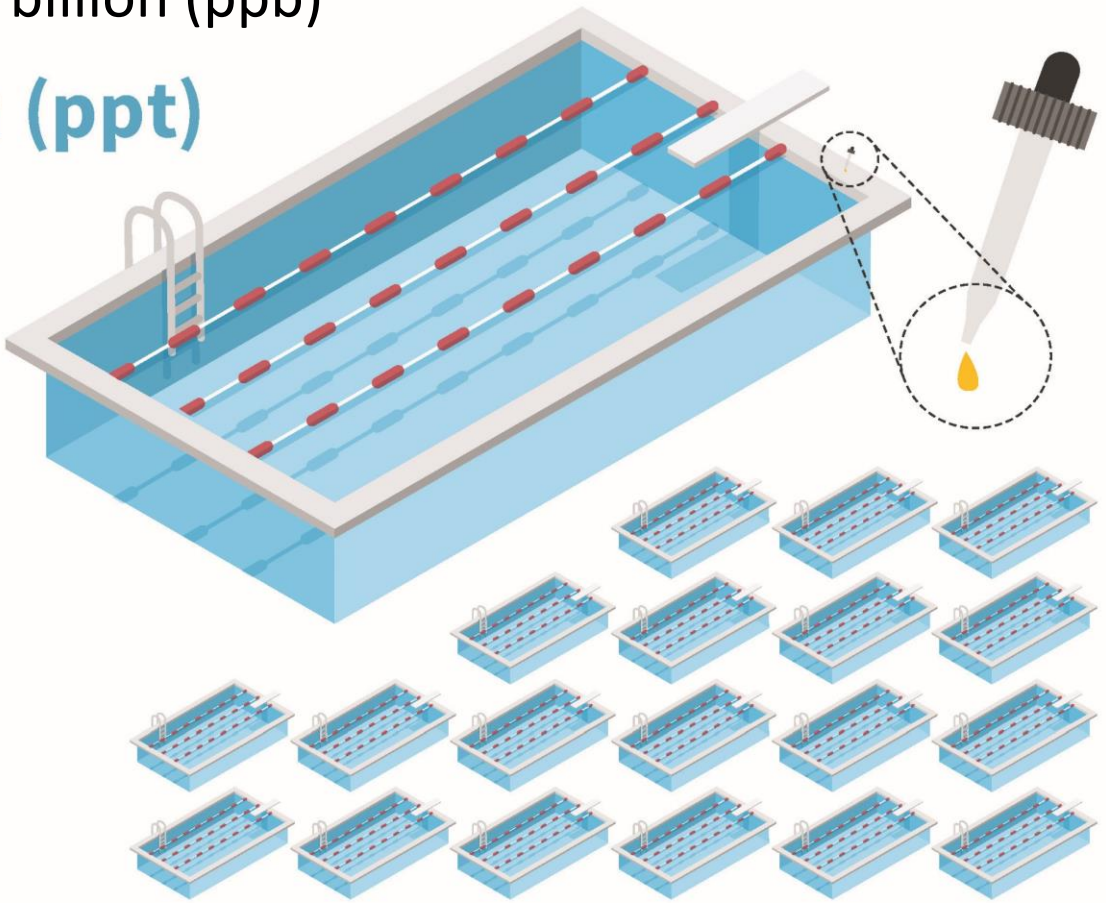
- Facilities using or storing aqueous film forming foams (AFFF), such as DoD installations, airports, oil refineries, fire training facilities, fire stations, etc.
- Manufacturing air emissions
- Chrome plating
- Other areas where detected:
  - Landfill leachates
  - Wastewater
  - Biosolids






# PFAS Analysis

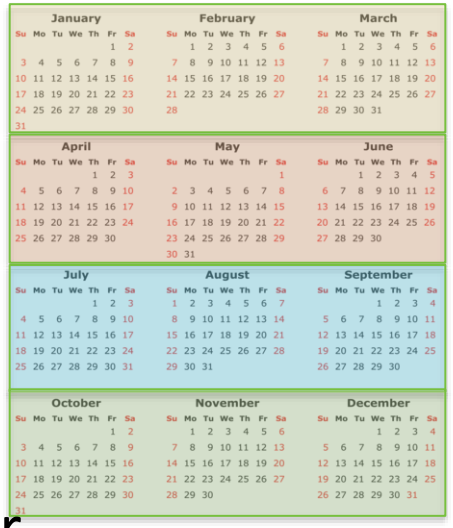
- Part per trillion (ppt) = nanogram per liter (ng/L) = 1/1000$^{th}$ of a part per billion (ppb)




*Courtesy of https://www.michigan.gov/documents/pfasresponse/1ppt_is_Equal_to_1_Drop_of_Water_in_20_Olympic_Swimming_Pools_664966_7.pdf*

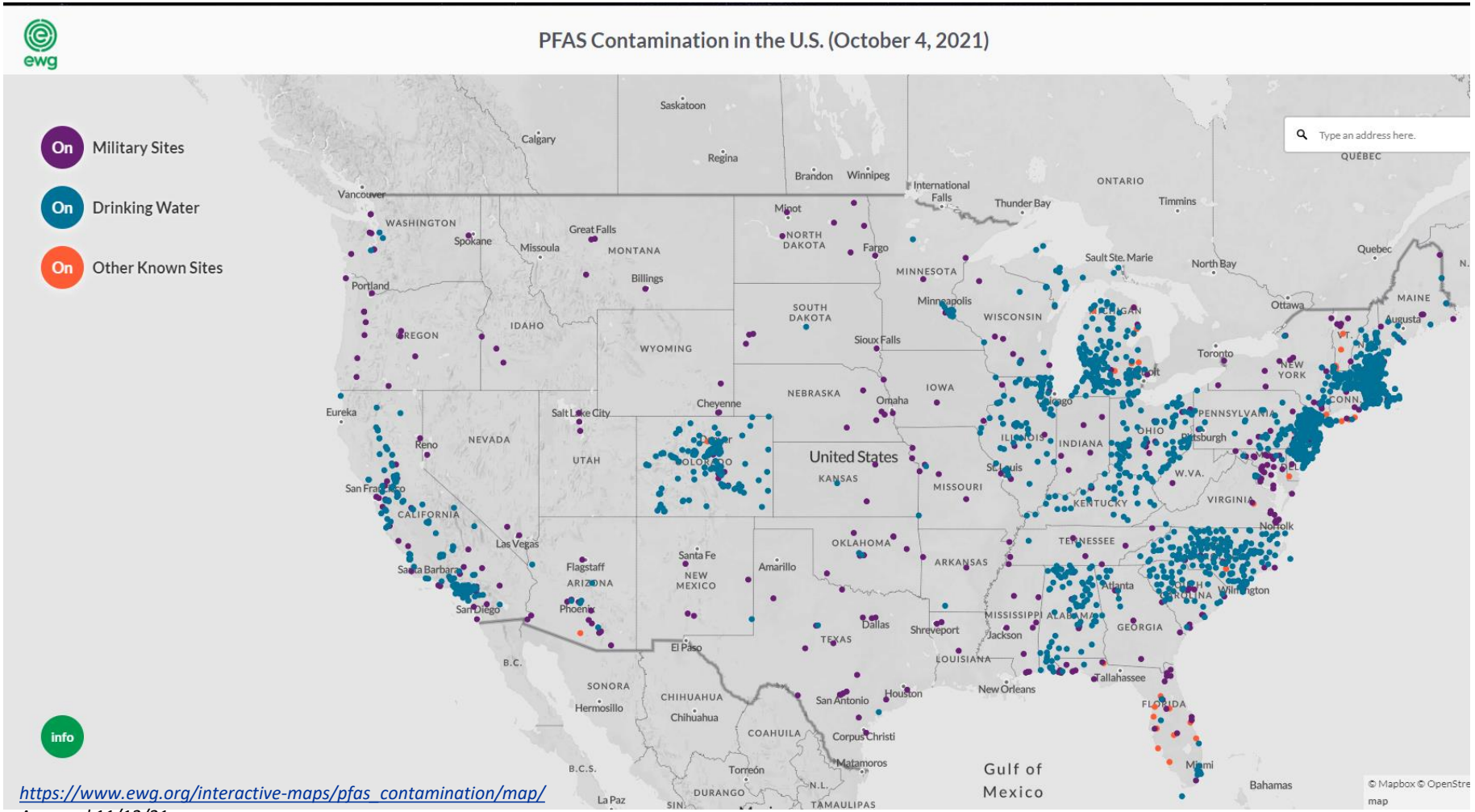
# PFAS Drinking Water Regulations

- No Federal Standard; EPA Health Advisory Level = 70 ppt
- Regulated in Massachusetts (effective April 2021 for Woburn)
  - Sum of 6 PFAS compounds
  - Monthly sampling
  - Standard = 20 parts per trillion (ppt) based on quarterly average




- EPA “PFAS Strategic Roadmap” announced October 2021
  - National regulation for PFOA and PFOS, evaluation of other PFAS (proposed rule fall 2022, final rule fall 2023)

# This is a National Issue: Monitoring for PFAS in Public Drinking Water Systems

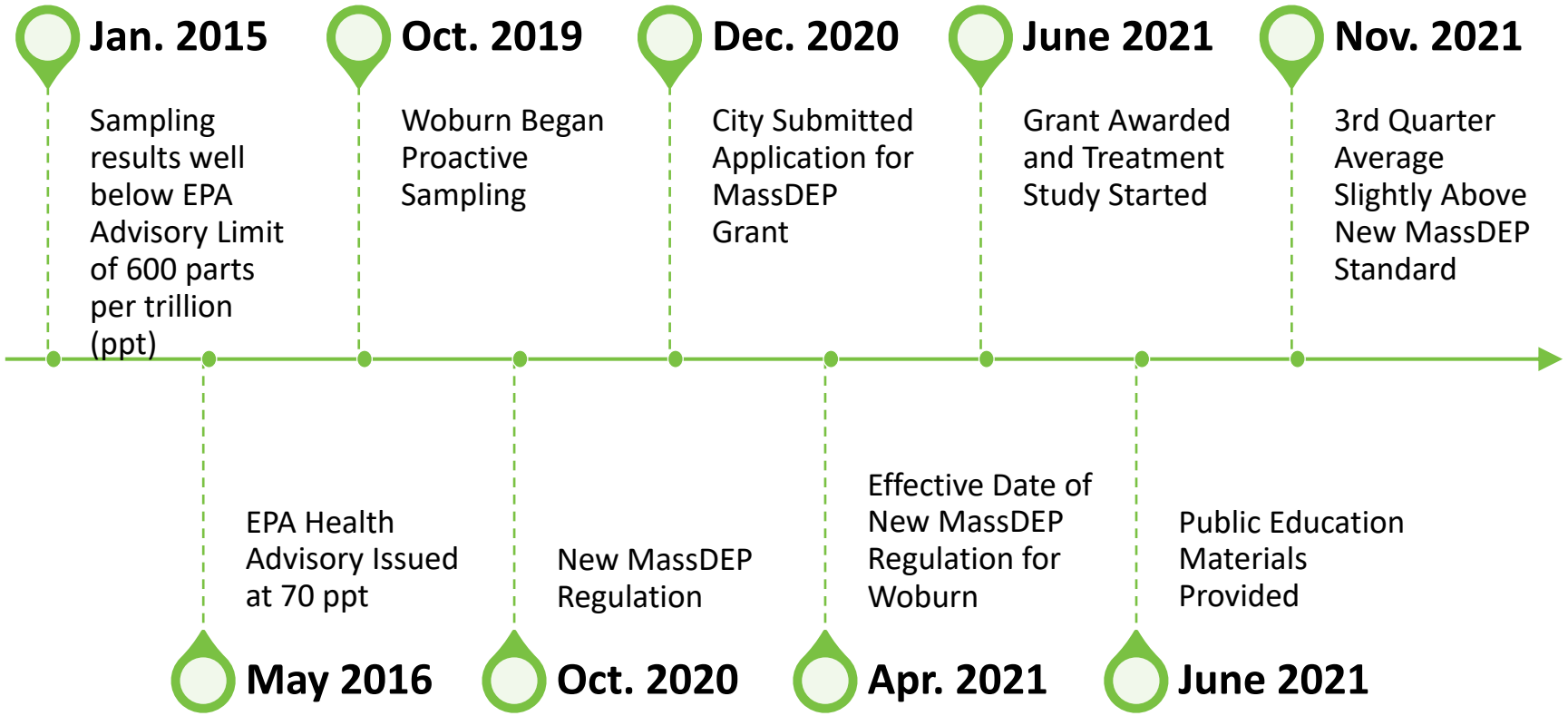



https://www.ewg.org/interactive-maps/pfas_contamination/map/

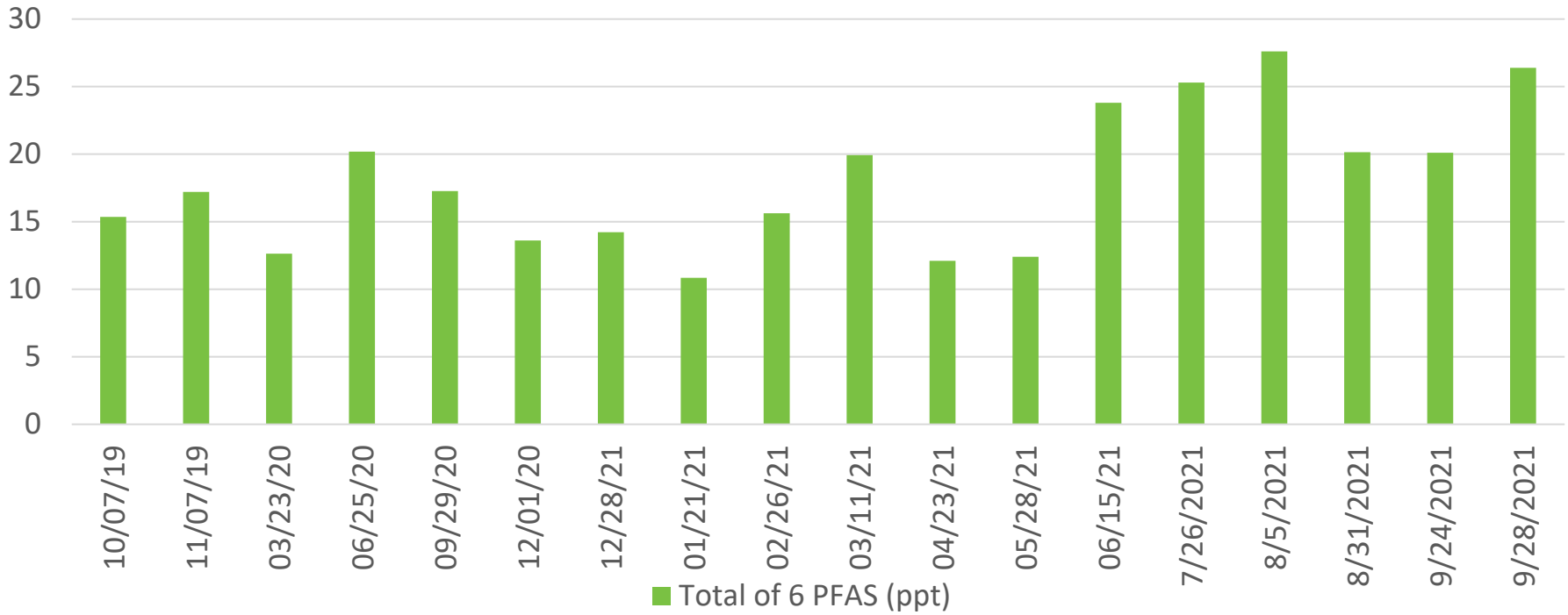
*Accessed 11/12/21*

# 3. Horn Pond Results

# PFAS Discovery and Response

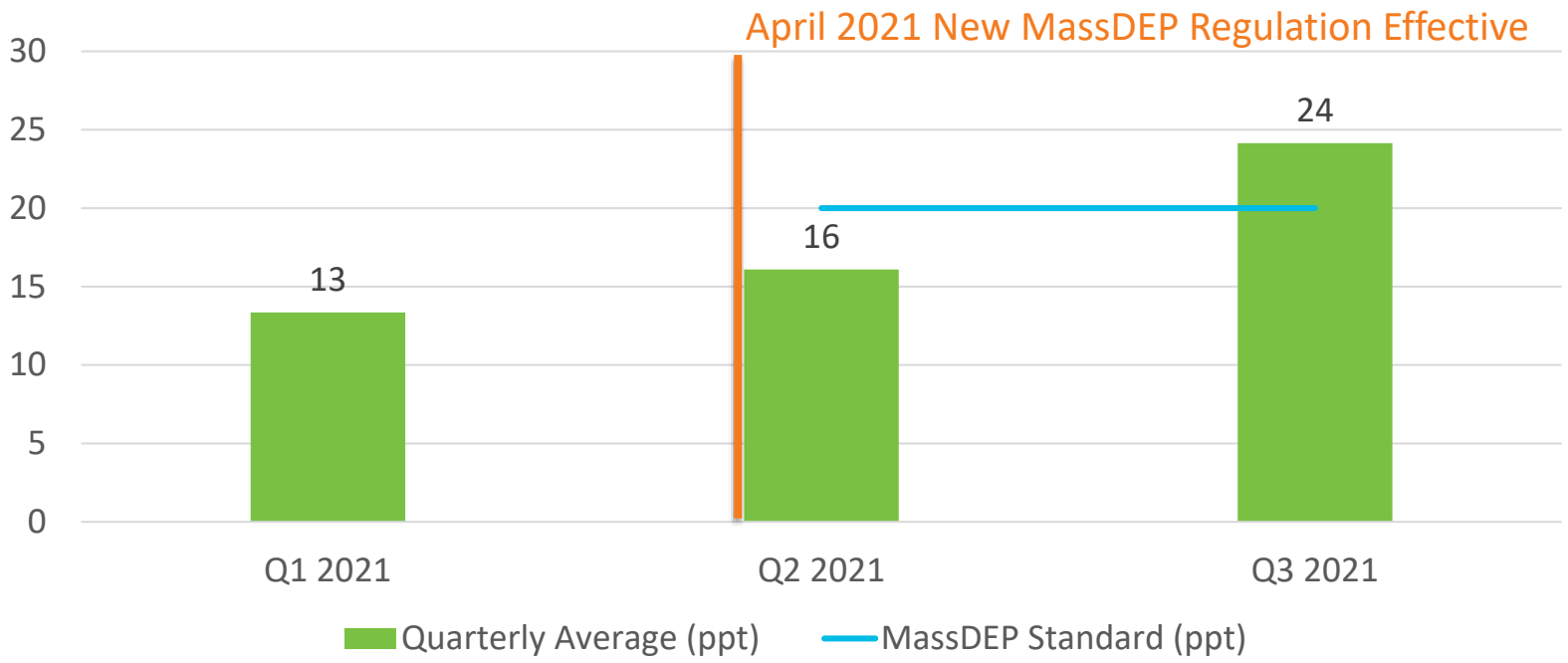


# PFAS Sampling Results




*Average = 18 ppt*

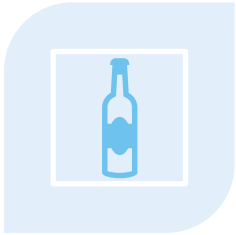
# Compliance with MassDEP Standard



# What is the City Doing?



Continue routine sampling of wells and treated water



Providing bottle filling station
*(sensitive subgroups)*

Investigating treatment options

Providing regular updates on levels detected

Identifying funding (e.g., state, federal, ARPA)

# What Should Consumers Do?

- MassDEP Advisory for **Sensitive Subgroups**
  - Avoid consuming water if above 20 ppt
  - Bottled water that has been tested
  - Bottle filling station (date to be announced)
- Consumers not in a sensitive subgroup may continue to consume the water
- Safe for washing foods, brushing teeth, bathing, showering
- Boiling the water will not destroy PFAS

## Sensitive Subgroups

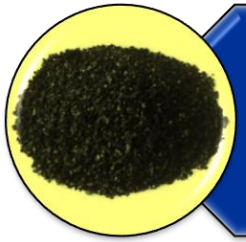
- Pregnant or nursing women
- Infants
- People diagnosed by health care provider to have compromised immune system

*MassDEP List of bottlers that comply with drinking water standards for PFAS* *https://www.mass.gov/doc/list-of-bottlers-october-7-2021-0/download*

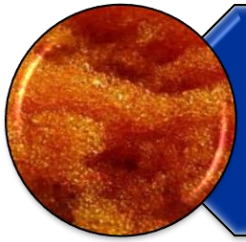
# 4. PFAS Treatment for Drinking Water

# PFAS Treatment for Drinking Water

- Available technologies for PFAS removal:



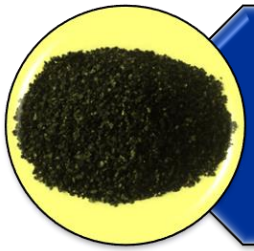
Granular Activated Carbon (GAC)



Anion Exchange (AIX)

High Pressure Membranes

# GAC Most Suitable Treatment Option for Woburn



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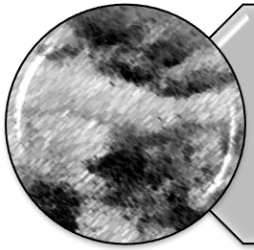

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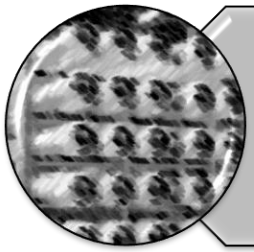


High Pressure Membranes

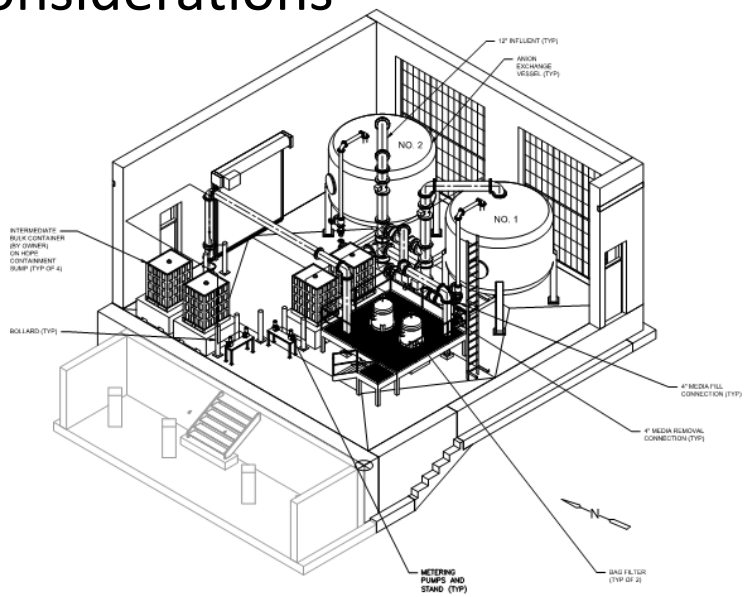
- ✓ Water quality (e.g., low organics)
- ✓ Compatible with existing treatment
- ✓ City's familiarity with GAC operation
- ✓ No regenerant stream of concern
- ✓ Comparatively lower cost (vs. membranes)

# *Example*: Granular Activated Carbon Treatment Facility

# Ongoing Bench-Scale Testing and Planning Study

1. Investigate effectiveness of three (3) commercially-available GAC products in removing PFAS
   - Calgon F400 GAC
   - Cabot Hydrodarco 4000
   - EVOQUA Ultracarb 1240LD

2. Determine design parameters and considerations pertinent to implementation of GAC
   - Floor plan
   - Site plan
   - Cost estimate
   - Permitting requirements



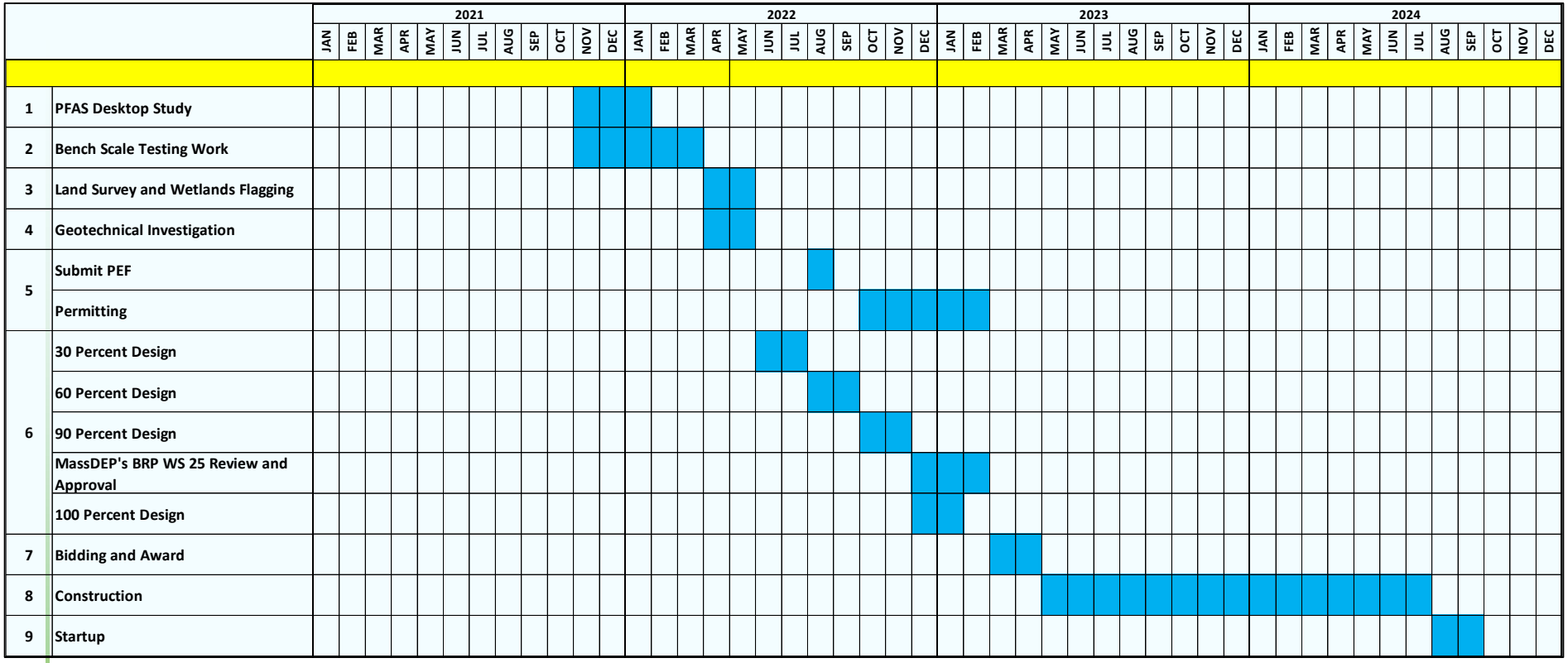
# 5. Next Steps and Timeline

# Next Steps

- Complete bench-scale and planning study
- Site investigations
  - Subsurface investigations (borings)
  - Survey
  - Environmental features (wetlands flagging, etc.)
- Design (30/60/90/100% milestones)
  - Cost estimates at 60 and 100%
- Submit funding application (State Revolving Fund; potential infrastructure funding)
- Permitting
- Bidding/contract award
- Construction
- Startup

In Parallel

# Anticipated Timeline



# 6. Questions/Discussion